Grasses of Missouri

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GRASSES OF MISSOURI: AN ANNOTATED CHECKLIST

Roy E. Gereau[1]

Introduction

For more than half of the present century, the system of Bentham (1881), with thirteen tribes grouped into the subfamilies Panicoideae and Festucoideae, provided the conceptual basis for classification within the grass family (Poaceae), and was almost universally employed in standard manuals and floras (e.g. Hitchcock 1951, Steyermark 1963). This system was based mainly on morphological characters of inflorescences and spikelets, and, though useful for cataloging and identifying the genera, led in some cases to highly artificial associations (e.g. *Festuca* and *Eragrostis* together in the Festuceae, *Agrostis* and *Sporobolus* together in the Agrostideae). In addition to external morphology, investigations of cytology (Avdulov 1931, Stebbins 1956, Tateoka 1960), leaf anatomy (Prat 1932; Brown 1958, 1961; Metcalfe 1960), embryology (Reeder 1957, 1962), bicellular microhairs (Tateoka et al. 1959), and chloroplast ultrastructure (Johnson 1964), provided new lines of evidence for grass classification, and led to various suggestions for its reorganization (e.g. Tateoka 1957, Prat 1960, Stebbins & Crampton 1961) based on observed correlations of diverse kinds of characters. The discovery in the mid-1960s of an alternative pathway for carbon fixation in photosynthesis (Hatch & Slack 1966, Hatch et al. 1967) provided an evolutionary rationale for many of these correlations, and an even greater impetus for the recognition of natural groups of grasses based on metabolic syndromes as well as morphological similarity (Brown 1977). Gould & Shaw (1983) provided a good historical summary and a classification of the genera of grasses of the United States, in which they recognized six subfamilies. Clayton & Renvoize (1986) have produced the first comprehensive, worldwide treatment of grass genera since that of Bentham & Hooker (1883, based on Bentham 1881), in which they recognize six subfamilies worldwide and considerably reorganize the subfamilial and tribal arrangement of Gould & Shaw (1983).

The present work is a list of the members of the Poaceae known to occur in the State of Missouri, with the genera arranged according to the system of Clayton & Renvoize (1986) (page numbers following genus names refer to location in Steyermark (1963)). It includes all species reported by Steyermark (1963), a number of additional species documented by literature citations, and two previously unpublished records from the Missouri Botanical Garden Herbarium (MO). Literature citations document nearly all taxonomic and nomenclatural changes from Steyermark (1963), and equivalent names in the *Flora of Missouri* are given in brackets. Though documented as carefully as possible with the opinions and decisions of others, the names used here reflect in all cases my own best judgement as to the entities involved, and are sure to meet with disagreement in

[1] Missouri Botanical Garden Herbarium, P. O. Box 299, St. Louis, MO 63166-0299.

numerous instances. "There is something here to annoy everyone; so do not bother to chastise -- think rather to improve." (preface, Clayton & Renvoize 1986)

POACEAE

SUBFAMILY ARUNDINOIDEAE

Tribe Aristideae

Aristida L. (p. 170) (three-awn grass)
adscensionis L.
basiramea Engelm. ex Vasey
dichotoma Michaux
var. *curtissii* A. Gray
var. *dichotoma*
lanosa Muhlenb. ex Elliott
longispica Poiret (Allred 1985)
var. *geniculata* (Raf.) Fern.
[= var. *geniculata* sensu Steyermark
= *A. intermedia* Scribner & C. Ball]
var. *longispica*
oligantha Michaux
purpurascens Poiret (Allred 1986)
var. *purpurascens*)
ramosissima A. Gray

Tribe Arundineae

Arundo L. (p. 116) (giant reed)
donax L.

Danthonia DC. (p. 142) (wild oat grass)
spicata (L.) P. Beauv. ex Roemer & Schultes

Phragmites Adans. (p. 116)
australis (Cav.) Steudel (Clayton 1968) [= *P. communis* Trin.]

SUBFAMILY BAMBUSOIDEAE

Tribe Bambuseae

Arundinaria Michaux (p. 81) (cane)
gigantea (Walter) Muhlenb.

Tribe Brachyelytreae

Brachyelytrum P. Beauv. (p. 168)
erectum (Roth) P. Beauv. var. *erectum*

Tribe Diarrheneae

Diarrhena P. Beauv. (p. 113) (beak grain)
americana P. Beauv.

Tribe Oryzeae

Leersia Sol. ex Swartz (p. 190) (cut grass, white grass)
lenticularis Michaux
oryzoides (L.) Swartz
virginica Willd.

Oryza L. (p. 190) (rice)
sativa L.

Zizania L. (p. 193) (wild rice)
aquatica L.

Zizaniopsis Doell & Asch. (p. 193) (water millet)
miliacea (Michaux) Doell & Asch.

SUBFAMILY CENTOSTECOIDEAE

Tribe Centostecae

Chasmanthium Link (p. 115) (spike grass) (Yates 1966)
latifolium (Michaux) Yates [= *Uniola latifolia* Michaux]
laxum (L.) Yates [= *Uniola laxa* (L.) Britton, Sterns & Pogg.]
sessiliflorum (Poiret) Yates (Ravell & Taylor 1984) [= *Uniola sessiliflora* Poiret]

SUBFAMILY CHLORIDOIDEAE

Tribe Cynodonteae

Bouteloua Lagasca (p. 182) (grama grass)
curtipendula (Michaux) Torrey
gracilis (Kunth) Lagasca ex Steudel
hirsuta Lagasca

Buchloe Engelm. (p. 184) (buffalo grass)
dactyloides (Nutt.) Engelm.

Chloris Swartz (p. 180) (windmill grass)
verticillata Nutt.
virgata Swartz

Cynodon Rich. (p. 177) (Bermuda grass)
dactylon (L.) Pers.

Gymnopogon P. Beauv. (p. 180) (beard grass)
ambiguus (Michaux) Britton, Sterns & Pogg.

Schedonnardus Steudel (p. 177) (tumble grass)
paniculatus (Nutt.) Trel.

Spartina Schreber (p. 179) (cord grass, slough grass)
pectinata Link

Tribe Eragrostideae

Calamovilfa (A. Gray) Hackel ex Scribner & Southworth (p. 145)
longifolia (Hook.) Scribner

Crypsis Aiton (p. 168) (Hammel & Reeder 1979)
schoenoides (L.) Lam. [= *Heleochloa schoenoides* (L.) Host]

Distichlis Raf. (p. 114) (salt grass) (Beetle 1943, 1955)
spicata (L.) E. Greene
var. *spicata* [= *D. spicata* sensu Steyermark]
var. *stricta* (Torrey) Scribner [= *D. stricta* (Torrey) Rydb.]

Eleusine Gaertner (p. 177) (goose grass)
indica (L.) Gaertner

Eragrostis Wolf (p. 103) (love grass)
barrelieri Daveau (Muehlenbach 1979)
capillaris (L.) Nees
cilianensis (All.) Vign. ex Janchen
curtipedicellata Buckley (Muehlenbach 1979)
curvula (Schrader) Nees
elliottii S. Watson (Muehlenbach 1979)
frankii Steudel
(?) *glomerata* (Walter) L. Dewey
hirsuta (Michaux) Nees
hypnoides (Lam.) Britton, Sterns & Pogg.
intermedia A. Hitchc.
minor Host (Koch 1978) [= *E. poaeoides* P. Beauv. ex Roemer & Schultes]
multicaulis Steudel (Muehlenbach 1979)
pectinacea (Michaux) Nees (Reeder 1986)
var. *miserrima* (Fourn.) Reeder [= *E. arida* A. Hitchc.)
var. *pectinacea* [= *E. pectinacea* sensu Steyermark]
pilosa (L.) P. Beauv.
reptans (Michaux) Nees
secundiflora C. Presl
subsp. *oxylepis* (Torrey) S. Koch (Muehlenbach 1969, Koch 1978) [= *E. oxylepis* (Torrey) Torrey]
spectabilis (Pursh) Steudel
trichodes (Nutt.) Alph. Wood

Leptochloa P. Beauv.(p. 176) (sensu McVaugh 1983, Sutherland 1986; not McNeill 1979)
dubia (Kunth) Nees (Muehlenbach 1979)
fascicularis (Lam.) A. Gray [= *Diplachne acuminata* Nash; = *D. fascicularis* (Lam.) P. Beauv.]
filiformis (Lam.) P. Beauv.
panicoides (C. Presl) A. Hitchc. [= *Diplachne halei* Nash]

Muhlenbergia Schreber (p. 153) (muhly)
asperifolia (Nees & Meyen) Parodi
bushii R. Pohl (Pohl 1969) [= *M. brachyphylla* Bush f. *brachyphylla* sensu Steyermark]
capillaris (Lam.) Trin.
X*curtisetosa* (Scribner) Bush (Pohl 1969) [= *M. schreberi* J. Gmelin var. *curtisetosa* (Scribner) Steyerm. & Kucera]
cuspidata (Hook.) Rydb.
frondosa (Poiret) Fern.
f. *commutata* (Scribner) Fern.
f. *frondosa* (Pohl 1969) [= *M.* brachyphylla Bush f. *aristata* E. J. Palmer & Steyerm.; = *M. sylvatica* (Torrey) Torrey var. *sylvatica* f. *attenuata* (Scribner) E. J. Palmer & Steyerm.]
glabrifloris Scribner
mexicana (L.) Trin.
f. *mexicana*

f. *ambigua* (Torrey) Fern.
racemosa (Michaux) Britton, Sterns & Pogg.
schreberi J. Gmelin [= *M. schreberi* var. *schreberi* sensu Steyermark]
sobolifera (Muhlenb.) Trin.
f. *setigera* (Scribner) Deam
f. *sobolifera*
sylvatica (Torrey) Torrey [= *M. sylvatica* var. *sylvatica* f. *sylvatica* sensu Steyermark]
tenuiflora (Willd.) Britton, Sterns & Pogg.
var. *tenuiflora* (Pohl 1969)

Sporobolus R. Br. (p. 161) (dropseed)
airoides (Torrey) Torrey
asper (Michaux) Kunth (Riggins 1977)
var. *asper* [= var. *asper* sensu Steyermark; = var. *pilosus* (Vasey) A. Hitchc.]
var. *drummondii* (Trin.) Vasey [= var. *hookeri* (Trin.) Vasey]
clandestinus (Biehler) A. Hitchc.
cryptandrus (Torrey) A. Gray
heterolepis (A. Gray) A. Gray
indicus (L.) R. Br. (Clayton 1965) [= *S. poiretii* (Roemer & Schultes) A. Hitchc.]
neglectus Nash [= *S. neglectus* var. *neglectus* sensu Steyermark]
ozarkanus Fern. (Reeder 1975) [= *S. neglectus* Nash var. *ozarkanus* (Fern.) Steyerm. & Kucera]
pyramidatus (Lam.) A. Hitchc.
vaginiflorus (Torrey ex A. Gray) Alph. Wood

Tridens Roemer & Schultes (p. 118) (Tateoka 1961)
flavus (L.) A. Hitchc.
var. *chapmanii* (Small) Shinn. [= *T. chapmanii* (Small) Chase]
var. *flavus* [= *T. flavus* sensu Steyermark]
muticus (Torrey) Nash var. *elongatus* (Buckley) Shinn. [= *T. elongatus* (Buckley) Nash]
oklahomensis (Feath.) Feath.
strictus (Nutt.) Nash

Triplasis P. Beauv. (p. 121) (sand grass)
purpurea (Walter) Chapman

SUBFAMILY PANICOIDEAE

Tribe Andropogoneae

Andropogon L. (p. 243) (beard grass)
elliottii Chapman
gerardii Vitman
var. *chrysocomus* (Nash) Fern.
var. *gerardii*
ternarius Michaux
virginicus L.

Arthraxon P. Beauv. (p. 242) (Kiger 1971, van Welzen 1981)
hispidus (Thunb.) Makino var. *hispidus* sensu lato [incl. var. *cryptatherus* (Hackel) Honda]

Bothriochloa Kuntze (bluestem)
bladhii (Retz.) S. T. Blake (Dunn 1982)
laguroides (DC.) Herter (Allred & Gould 1983)
subsp. *torreyana* (Steudel) Allred & Gould [= *Andropogon saccharoides* Swartz sensu Steyermark]

Coelorachis Brongn. (p. 252) (joint grass) (Clayton 1966)
cylindrica (Michaux) Nash [= *Manisuris cylindrica* (Michaux) Kuntze]

Erianthus Michaux (p. 241) (plume grass)
alopecuroides (L.) Elliott
ravennae (L.) P. Beauv.
strictus Baldwin

Miscanthus Andersson (p. 241)
floridulus (Labill.) Warb. ex Schumann & Lauterb.
sacchariflorus (Maxim.) Hackel (*DeLozier & Gibbs 1604*, MO)
sinensis Andersson (*Steyermark & Branson 132195*, MO)

Schizachyrium Nees (bluestem) (Gould 1967)
scoparium (Michaux) Nash [= *Andropogon scoparius* Michaux]

Sorghastrum Nash (p. 252) (Indian grass)
nutans (L.) Nash

Sorghum Moench (p. 248) (sorghum)
bicolor (L.) Moench (deWet 1978) [incl. all cultivated species & varieties]
halepense (L.) Pers.

Tripsacum L. (p. 254) (gama grass)
dactyloides (L.) L.

Zea L. (p. 254) (maize, corn) (Iltis & Doebley 1980)
may L. subsp. *mays*

Tribe Paniceae

Brachiaria (Trin.) Griseb. (p. 198)
eruciformis (Smith) Griseb.
platyphylla (Griseb.) Nash

Cenchrus L. (p. 240) (sandbur)
ciliaris L. (DeLisle 1963) [= *Pennisetum ciliare* (L.) Link]
longispinus (Hackel) Fern.

Dichanthelium (A. Hitchc. & Chase) Gould (Gould & Clark 1978)
acuminatum (Swartz) Gould & C. A. Clark
var. *acuminatum* sensu lato, incl. var. *implicatum* (Scribner) Gould & C. A. Clark & var. *lindheimeri* (Nash) Gould & C. A. Clark; (Stephenson 1984, as var. *implicatum*) [= *Panicum lanuginosum* Elliott; = *P. subvillosum* Ashe]
var. *longiligulatum* (Nash) Gould & C. A. Clark [= *Panicum longiligulatum* Nash]
var. *villosum* (A. Gray) Gould & C. A. Clark [= *Panicum praecocius* A. Hitchc. & Chase; = *P. villosissimum* Nash]

boreale (Nash) Freckmann [= *Panicum bicknellii* Nash; = *P. calliphyllum* Ashe]
boscii (Poiret) Gould & C. A. Clark [= *Panicum boscii* Poiret]
clandestinum (L.) Gould [= *Panicum clandestinum* L.]
commutatum (Schultes) Gould [= *Panicum commutatum* Schultes]
depauperatum (Muhlenb.) Gould [= *Panicum depauperatum* Muhlenb.]
dichotomum (L.) Gould var. *dichotomum* [= *Panicum annulum* Ashe; = *P. dichotomum* L.; = *P. microcarpon* Muhlenb.; = *P. nitidum* Lam.]
latifolium (L.) Gould & C. A. Clark [= *Panicum latifolium* L.]
laxiflorum (Lam.) Gould [= *Panicum laxiflorum* Lam.]
leibergii (Vasey) Freckmann [= *Panicum leibergii* (Vasey) Scribner]
linearifolium (Scribner) Gould [= *Panicum linearifolium* Scribner; = *P. perlongum* Nash]
malacophyllum (Nash) Gould [= *Panicum malacophyllum* Nash]
oligosanthes (Schultes) Gould
var. *oligosanthes* [= *Panicum oligosanthes* Schultes var. *oligosanthes*]
var. *scribnerianum* (Nash) Gould [= *Panicum oligosanthes* var. *helleri* (Nash) Fern., & var. *scribnerianum* (Nash) Fern.]
ravenelii (Scribner & Merr.) Gould [= *Panicum ravenelii* Scribner & Merr.]
sabulorum (Lam.) Gould & C. A. Clark var. *thinium* (A. Hitchc. & Chase) Gould & C. A. Clark (Ravell & Taylor 1984) [= *Panicum columbianum* Scribner]
scoparium (Lam.) Gould [= *Panicum scoparium* Lam.]
sphaerocarpon (Elliott) Gould
var. *isophyllum* (Scribner) Gould & C. A. Clark [= *Panicum polyanthes* Schultes]
var. *sphaerocarpon* [= *Panicum sphaerocarpon* Elliott]

Digitaria Haller (p. 194) (crab grass)
ciliaris (Retz.) Koeler (Gould 1963, Webster 1987) [= *D. sanguinalis* (L.) Scop. var. *ciliaris* (Retz.) Parl.]
cognata (Schultes) Pilger (Veldkamp 1973) [= *Leptoloma cognatum* (Schultes) Chase]
filiformis (L.) Koeler
ischaemum (Schreber) Muhlenb.
sanguinalis (L.) Scop. [= *D. sanguinalis* var. *sanguinalis* sensu Steyermark]

Echinochloa P. Beauv. (p. 232) (barnyard grass) (Gould et al. 1972)
colonum (L.) Link
crusgalli (L.) P. Beauv.
var. *crusgalli*
var. *frumentacea* (Roxb.) W. Wight
muricata (P. Beauv.) Fern.
var. *microstachya* Wieg. [= var. *microstachya* sensu Steyermark; = var. *occidentalis* Wieg.]
var. *muricata* [= var. *ludoviciana* Wieg.; = var. *muricata* sensu Steyermark]
utilis Ohwi & Yab. (Muehlenbach 1983)

Eriochloa Kunth (p. 197) (cup grass) (Shaw & Webster 1987)
acuminata (C. Presl) Kunth var. *acuminata* [= *E. gracilis*

(Fourn.) A. Hitchc. var. *gracilis*]
contracta A. Hitchc.

Panicum L. (p. 206) (panic grass)
anceps Michaux
capillare L.
dichotomiflorum Michaux
flexile (Gattinger) Scribner
hians Elliott
miliaceum L.
obtusum Kunth
philadelphicum Trin.[2] [= *P. gattingeri* Nash; = *P. philadelphicum* sensu Steyermark]
rigidulum Nees (sensu Gould 1975) [= *P. agrostoides* Sprengel, nom. illegit.; = *P. stipitatum* Nash]
texanum Buckley
virgatum L.

Paspalidium Stapf (McVaugh 1983)
geminatum (Forssk.) Stapf var. *geminatum* (Gould 1971) [=*Panicum geminatum* Forssk. sensu Steyermark]

Paspalum L. (p. 198)
dilatatum Poiret
dissectum (L.) L.
floridanum Michaux
var. *floridanum*
var. *glabratum* Engelm. ex Vasey
fluitans (Elliott) Kunth
laeve Michaux
var. *circulare* (Nash) Fern.
var. *laeve*
var. *pilosum* Scribner
pubiflorum Rupr. ex Fourn.
var. *glabrum* Vasey ex Scribner
setaceum Michaux (Banks 1966)
var. *ciliatifolium* (Michaux) Vasey [= *P. ciliatifolium* Michaux var. *ciliatifolium*]
var. *muhlenbergii* (Nash) D. Banks [= *P. ciliatifolium* var. *muhlenbergii* (Nash) Fern.]
var. *setaceum*
var. *stramineum* (Nash) D. Banks [= *P. bushii* Nash; = *P. ciliatifolium* var. *stramineum* (Nash) Fern.]
urvillei Steudel (Raveill & Taylor 1983)

Setaria P. Beauv. (p. 236) (foxtail grass)
faberi R. Herrm.
italica (L.) P. Beauv.
parviflora (Poiret) Kerguélen (Kerguélen 1987) [= *S. geniculata* (Lam.) P. Beauv.]
pumila (Poiret) Roemer & Schultes (Kerguélen 1977, Clayton 1979) [= *S. glauca* (L.) P. Beauv.]
verticillata (L.) P. Beauv.
viridis (L.) P. Beauv.

SUBFAMILY POOIDEAE

Tribe Aveneae

Agrostis L. (p. 145) (bent grass)
elliotiana Schultes
gigantea Roth (Philipson 1937) [= *A. alba* L. var. *alba*]
hyemalis (Walter) Britton, Sterns & Pogg. var. *hyemalis*
perennans (Walter) Tuckerman
stolonifera L. (Philipson 1937)
var. *palustris* (Hudson) Farw. [= *A. alba* L. var. *palustris* (Hudson) Pers.]
tenuis Sibth.

Aira L. (p. 139) (hair grass)
caryophyllea L. (Castaner 1983, Freckmann 1983)
elegantissima Schur (Kerguélen 1975) [= *A. elegans* Willd. ex Gaudin]

Alopecurus L. (p. 152) (foxtail)
aequalis Sobol.
carolinianus Walter
pratensis L.

Anthoxanthum L. (p. 186) (sweet vernal grass)
odoratum L.

Apera Adans. (silky bent grass) (McNeill 1981)
interrupta (L.) P. Beauv. [= *Agrostis interrupta* L.]
spicaventi (L.) P. Beauv. [= *Agrostis spicaventi* L.]

Arrhenatherum P. Beauv. (p. 140) (oat grass)
elatius (L.) P. Beauv. ex J. S. & C. Presl

Avena L. (p. 140) (oats) (Baum 1977)
fatua L. (Haussknecht 1885)
var. *fatua* [= *A. fatua* sensu Steyermark]
var. *sativa* (L.) Hausskn. [= *A. sativa* L.]

Beckmannia Host (p. 179)
syzigachne (Steudel) Fern.

Calamagrostis Adans. (p. 144) (reed bent grass)
canadensis (Michaux) P. Beauv.
insperata Swallen
stricta (Timm) Koeler (Sutherland 1986) [= *C. inexpansa* A. Gray]

Cinna L. (p. 150) (wood reed grass)
arundinacea L.

Holcus L. (p. 142) (velvet grass)
lanatus L.

Koeleria Pers. (p. 136) (June grass)
pyramidata (Lam.) P. Beauv. (Greuter 1968) [= *K. cristata* (L.) Pers., nom. illegit.]

Phalaris L. (p. 188) (canary grass)
arundinacea L.
brachystachya Link
canariensis L.
caroliniana Walter

Phleum L. (p. 153) (timothy)
pratense L.

Sphenopholis Scribner (p. 136) (wedge grass) (Erdman 1965)
nitida (Biehler) Scribner
obtusata (Michaux) Scribner
var. *major* (Torrey) Erdman [= *S. intermedia* Rydb.)
var. *obtusata* [= *S. obtusata* sensu Steyermark]
pensylvanica (L.) A. Hitchc. [= *Trisetum pensylvanicum* (L.) P. Beauv.]

Trisetum Pers. (p. 139)
flavescens (L.) P. Beauv.

Tribe Bromeae

Bromus L. (p. 82) (brome grass)
arvensis L. (Muehlenbach 1983)
catharticus Vahl
commutatus Schrader (sensu Smith 1980) [= *B. racemosus* L. sensu Steyermark, pro parte]
diandrus Roth (sensu Smith 1980) [= *B. rigidus* Roth sensu Steyermark]
hordeaceus L. subsp. *hordeaceus* (Smith 1968, 1980) [= *B. mollis* L.]
inermis Leysser
japonicus Murray
latiglumis (Shear) A. Hitchc.
pubescens Willd. (Wagnon 1952) [= *B. purgans* L.]
racemosus L.
secalinus L.
squarrosus L.
sterilis L.
tectorum L.

Tribe Meliceae

Glyceria R. Br. (p. 94) (manna grass)
acutiflora Torrey
septentrionalis A. Hitchc.
var. *septentrionalis*
var. *arkansana* (Fern.) Steyerm. & Kucera
striata (Lam.) A. Hitchc.

Melica L. (p. 118) (melic grass)
nitens (Scribner) Nutt. ex Piper

Tribe Poeae

Cynosurus L. (p. 1652)
echinatus L. (Raveill & Taylor 1983)

Dactylis L. (p. 115) (orchard grass)
glomerata L.

Festuca L. (p. 89) (fescue)
arundinacea Schreber (Lorenzoni 1966, Terrell 1967) [= *F. elatior* L. var. *arundinacea* (Schreber) Wimmer]

longifolia Thuill. (Kerguelén 1975, McNeill & Dore 1976) [= *F. ovina* L. var. *duriuscula* (L.) Koch]
obtusa Biehler
ovina L. [= *F. ovina* var. *ovina* sensu Steyermark]
paradoxa Desv.
pratensis Hudson (Lorenzoni 1966, Terrell 1967) [= *F. elatior* L. var. *elatior*]
rubra L.

Lolium L. (p. 134) (rye grass)
perenne L. (sensu Gould 1975) [= *L. multiflorum* Lam.; = *L. perenne* sensu Steyermark]
persicum Boiss. & Hohen. (Muehlenbach 1979)
rigidum Gaudin (Muehlenbach 1979)
temulentum L. (Terrell 1968)
f. *arvense* (With.) Junge [= var. *temulentum* sensu Steyermark]
f. *temulentum* [= var. *macrochaeton* A. Braun]

Poa L. (p. 97) (blue grass)
annua L.
bulbosa L.
chapmaniana Scribner
compressa L.
palustris L.
pratensis L.
sylvestris A. Gray
trivialis L.
wolfii Scribner

Puccinellia Parl. (p. 94) (alkali grass)
distans (L.) Parl.
nuttalliana (Schultes) A. Hitchc. (Hitchcock 1912) [= *P. airoides* (Nutt.) S. Watson & J. Coulter]
pallida (Torrey) R. T. Clausen (Clausen 1952) [= *Glyceria pallida (Torrey) Trin.*]

Sclerochloa P. Beauv. (hardgrass)
dura (L.) P. Beauv. (Ladd 1983)

Vulpia C. Gmelin (annual fescue) (Lonard & Gould 1974)
myuros (L.) C. Gmelin var. *myuros* [= *Festuca myuros* L.]
octoflora (Walter) Rydb.
var. *glauca* (Nutt.) Fern. [= *Festuca octoflora* Walter var. *glauca* (Nutt.) Fern., and var. *tenella* (Willd.) Fern.]
var. *octoflora* [= *Festuca octoflora* var. *octoflora*]
sciurea (Nutt.) Henrard [= *Festuca sciurea* Nutt.)

Tribe Stipeae

Oryzopsis Michaux (p. 168) (mountain rice)
racemosa (Smith) A. Hitchc.

Stipa L. (p. 170) (porcupine grass)
spartea Trin.

Tribe Triticeae

Agropyron Gaertner (p. 121) (Runemark & Heneen 1968, Estes & Tyrl 1982)

desertorum (Fischer ex Link) Schultes (Muehlenbach 1979)

Elymus L. (p. 126) (Runemark & Heneen 1968, Estes & Tyrl 1982)
canadensis L. var. *canadensis* (sensu Gould 1975) [= *E. canadensis* sensu Steyermark; = *E. villosus* "Muhl."]
diversiglumis Scribner & C. Ball (Church 1967) [= *E. interruptus* Buckley sensu Steyermark]
elongatus (Host) Runem. (Muehlenbach 1979, Heneen & Runemark 1972) [= *Agropyron elongatum* (Host) P. Beauv.]
glaucus Buckley
hystrix L. (McNeill & Dore 1976) [= *Hystrix patula* Moench]
longifolius (J. G. Smith) Gould (Gould 1974) [= *Sitanion longifolium* J. G. Smith]
repens (L.) Gould (Gould 1947) [= *Agropyron repens* (L.) P. Beauv.]
riparius Wieg.
smithii (Rydb.) Gould (Gould 1947) [= *Agropyron smithii* Rydb.]
trachycaulus (Link) Gould ex Shinn. (Shinners 1954) [= *Agropyron trachycaulum* (Link) Malte]
virginicus L.

Hordeum L. (p. 132) (barley)
X*caespitosum* Scribner (Mitchell & Wilton 1964) [= *H. jubatum* L. var. *caespitosum* (Scribner) A. Hitchc.]
jubatum L. [= *H. jubatum* var. *jubatum* sensu Steyermark]
pusillum Nutt.
vulgare L.

Secale L. (p. 126) (rye)
cereale L.

Triticum L. (p. 124) (wheat) (sensu Gould 1975)
aestivum L.
cylindricum (Host) Cesati, Passer. & Gibelli [= *Aegilops cylindrica* Host]

The above list contains the following numbers of accepted taxa within the family Poaceae in the State of Missouri: 6 subfamilies; 17 tribes; 84 genera; 266 species; 4 subspecies; 56 varieties; and 8 forms.

SUMMARY OF NAME CHANGES

The following is an alphabetical listing of names of taxa in Steyermark (1963) that have been changed, and their equivalents in the present work. Page numbers refer to location in Steyermark (1963); the number and letter in parentheses before the currently accepted name refer to its subfamily and tribe in the present treatment, as follows:

1. ARUNDINOIDEAE
   A. Aristideae
   B. Arundineae
2. BAMBUSOIDEAE
   A. Bambuseae
   B. Brachyelytreae
   C. Diarrheneae
   D. Oryzeae
3. CENTOSTECOIDEAE
   A. Centosteceae
4. CHLORIDOIDEAE
   A. Cynodonteae
   B. Eragrostideae
5. PANICOIDEAE
   A. Andropodoneae
   B. Paniceae
6. POOIDEAE
   A. Aveneae
   B. Bromeae
   C. Meliceae
   D. Poeae
   E. Stipeae
   F. Triticeae

Name in Steyermark (1963)	Current Name
Aegilops cylindrica (p. 126)	(6F) *Triticum cylindricum*
Agropyron repens (p. 122)	(6F) *Elymus repens*
smithii (p. 124)	(6F) *Elymus smithii*
trachycaulum (p. 124)	(6F) *Elymus trachycaulus*
Agrostis alba (p. 146) var. *alba*	(6A) *A. gigantea*
var. *palustris*	(6A) *A. stolonifera* var. *palustris*
interrupta (p. 146)	(6A) *Apera interrupta*
spicaventi (p. 146)	(6A) *Apera spicaventi*
Aira elegans (p. 139)	(6A) *A. elegantissima*
Andropogon saccharoides (p. 248)	(5A) *Bothriochloa laguroides* subsp. *torreyana*
scoparius (p. 243)	(5A) *Schizachyrium scoparium*
Aristida intermedia (p. 174)	(1A) *A. longispica* var. *geniculata*
Avena fatua (p. 140)	(6A) *A. fatua* var. *fatua*
sativa (p. 140)	(6A) *A. fatua* var. *sativa*
Bromus mollis (p. 86)	(6B) *B. hordeaceus* subsp. *hordeaceus*
purgans (p. 84)	(6B) *B. pubescens*
rigidus (p. 88)	(6B) *B. diandrus*
Calamagrostis inexpansa (p. 145)	(6A) *C. stricta*
Digitaria sanguinalis (p. 194)	
var. *ciliaris*	(5B) *D. ciliaris*
var. *sanguinalis*	(5B) *D. sanguinalis*

Diplachne acuminata (p. 113)	(4B)*Leptochloa fascicularis*
fascicularis (p. 113)	(4B)*Leptochloa fascicularis*
halei (p. 113)	(4B)*Leptochloa panicoides*
Distichlis spicata (p. 114)	(4B)*D. spicata* var. *spicata*
stricta (p. 114)	(4B)*D. spicata* var. *stricta*
Echinochloa muricata (p. 234)	
var. *ludoviciana*	(5B)*E. muricata* var. *muricata*
var. *occidentalis*	(5B)*E. muricata* var. *microstachya*
Elymus canadensis (p. 130)	(6F)*E. canadensis* var. *canadensis*
interruptus (p. 128)	(6F)*E. diversiglumis*
villosus (p. 128)	(6F)*E. canadensis* var. *canadensis*
Eragrostis arida (p. 108)	(4B)*E. pectinacea* var. *miserrima*
pectinacea (p. 107)	(4B)*E. pectinacea* var. *pectinacea*
poaeoides (p. 108)	(4B)*E. minor*
Eriochloa gracilis (p. 197)	
var. *gracilis*	(5B)*E. acuminata* var. *acuminata*
Festuca elatior (p. 92)	
var. *arundinacea*	(6D)*F. arundinacea*
var. *elatior*	(6D)*F. pratensis*
myuros (p. 90)	(6D)*Vulpia myuros* var. *myuros*
octoflora (p. 90)	
var. *glauca*	(6D)*Vulpia octoflora* var. *glauca*
var. *octoflora*	(6D)*Vulpia octoflora* var. *octoflora*
var. *tenella*	(6D)*Vulpia octoflora* var. *glauca*
ovina (p. 93)	
var. *duriuscula*	(6D)*F. longifolia*
var. *ovina*	(6D)*F. ovina*
sciurea (p. 90)	(6D)*Vulpia sciurea*
Glyceria pallida (p. 97)	(6D)*Puccinellia pallida*
Heleochloa schoenoides (p. 168)	(4B)*Crypsis schoenoides*
Hordeum jubatum (p. 133)	
var. *caespitosum*	(6F)*H.* X*caespitosum*
var. *jubatum*	*(6F)H. jubatum*
Hystrix patula (p. 132)	(6F)*Elymus hystrix*
Koeleria cristata (p. 136)	(6A)*K. pyramidata*
Leptoloma cognatum (p. 197)	(5B)*Digitaria cognata*
Lolium multiflorum (p. 134)	*(6D)L. perenne*
temulentum (p. 136)	
var. *macrochaeton*	(6D)*L. temulentum* f. *temulentum*
var. *temulentum*	(6D)*L. temulentum* f. *arvense*
Manisuris cylindrica (p. 252)	(5A)*Coelorachis cylindrica*
Muhlenbergia brachyphylla (p. 155)	
f. *aristata*	(4B)*M. frondosa* f. *frondosa*
f. *brachyphylla*	(4B)*M. bushii*

schreberi (p. 160)	
var. *curtisetosa*	(4B)*M.* Xcurtisetosa
var. *schreberi*	(4B)*M. schreberi*
sylvatica (p. 158)	
var. *sylvatica*	
f. *attenuata*	(4B)*M. frondosa* f. *frondosa*
f. *sylvatica*	(4B)*M. sylvatica*
Panicum agrostoides (p. 229)	(5B)*P. rigidulum*
annulum (p. 213)	(5B)*Dichanthelium dichotomum* var. *dichotomum*
bicknellii (p.212)	(5B)*Dichanthelium boreale*
boscii (p. 224)	(5B)*Dichanthelium boscii*
calliphyllum (p. 213)	(5B)*Dichanthelium boreale*
clandestinum (p. 222)	(5B)*Dichanthelium clandestinum*
commutatum (p. 221)	(5B)*Dichanthelium commutatum*
depauperatum (p. 211)	(5B)*Dichanthelium depauperatum*
dichotomum (p. 213)	(5B)*Dichanthelium dichotomum* var. *dichotomum*
gattingeri (p. 226)	(5B)*P. philadelphicum*[2]
geminatum (p. 225)	(5B)*Paspalidium geminatum* var. *geminatum*
lanuginosum (p. 214)	(5B)*Dichanthelium acuminatum* var. *acuminatum*
latifolium (p. 221)	(5B)*Dichanthelium latifolium*
laxiflorum (p. 212)	(5B)*Dichanthelium laxiflorum*
leibergii (p. 221)	(5B)*Dichanthelium leibergii*
linearifolium (p. 212)	(5B)*Dichanthelium linearifolium*
longiligulatum (p. 214)	(5B)*Dichanthelium acuminatum* var. *longiligulatum*
malacophyllum (p. 220)	(5B)*Dichanthelium malacophyllum*
microcarpon (p. 213)	(5B)*Dichanthelium dichotomum* var. *dichotomum*
nitidum (p. 213)	(5B)*Dichanthelium dichotomum* var. *dichotomum*
oligosanthes (p. 220)	
var. *helleri*	(5B)*Dichanthelium oligosanthes* var. *scribnerianum*
var. *oligosanthes*	(5B)*Dichanthelium oligosanthes* var. *oligosanthes*
var. *scribnerianum*	(5B)*Dichanthelium oligosanthes* var. *scribnerianum*
perlongum (p. 211)	(5B)*Dichanthelium linearifolium*
polyanthes (p. 218)	(5B)*Dichanthelium sphaerocarpon* var. *isophyllum*
praecocius (p. 217)	(5B)*Dichanthelium acuminatum* var. *villosum*
ravenelii (p. 221)	(5B)*Dichanthelium ravenelii*
scoparium (p. 221)	(5B)*Dichanthelium scoparium*
sphaerocarpon (p. 218)	(5B)*Dichanthelium sphaerocarpon* var. *sphaerocarpon*
stipitatum (p. 229)	(5B)*P. rigidulum*
subvillosum (p. 217)	(5B)*Dichanthelium acuminatum* var. *acuminatum*
villosissimum (p. 217)	(5B)*Dichanthelium acuminatum* var. *villosum*
Paspalum bushii (p. 202)	(5B)*P. setaceum* var. *stramineum*

ciliatifolium (p. 201)	
var. *ciliatifolium*	(5B)*P. setaceum* var. *ciliatifolium*
var. *muhlenbergii*	(5B)*P. setaceum* var. *muhlenbergii*
var. *stramineum*	(5B)*P. setaceum* var. *stramineum*
Pennisetum ciliare (p. 1652)	(5B)*Cenchrus ciliaris*
Phragmites communis (p. 116)	(1B)*P. australis*
Puccinellia airoides (p. 94)	(6D)*P. nuttalliana*
Setaria geniculata (p. 237)	(5B)*S. parviflora*
glauca (p. 237)	(5B)*S. pumila*
Sitanion longifolium (p. 132)	(6F)*Elymus longifolius*
Sorghum cult. spp. & var. (p. 249)	(5A)*S. bicolor*
Sphenopholis intermedia (p. 138)	(6A)*S. obtusata* var. *major*
obtusata (p. 138)	(6A)*S. obtusata* var. *obtusata*
Sporobolus asper (p. 165)	
var. *hookeri*	(4B)*S. asper* var. *drummondii*
var. *pilosus*	(4B)*S. asper* var. *asper*
neglectus (p. 164)	
var. *neglectus*	(4B)*S. neglectus*
var. *ozarkanus*	(4B)*S. ozarkanus*
poiretii (p. 165)	(4B)*S. indicus*
Tridens chapmanii (p. 120)	(4B)*T. flavus* var. *chapmanii*
elongatus (p. 121)	(4B)*T. muticus* var. *elongatus*
flavus (p. 120)	(4B)*T. flavus* var. *flavus*
Trisetum pensylvanicum (p. 139)	(6A)*Sphenopholis pensylvanica*
Uniola latifolia (p. 115)	(3A)*Chasmanthium latifolium*
laxa (p. 115)	(3A)*Chasmanthium laxum*

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2 The complex and overlapping pattern of variability in the characters used by Steyermark (1963) and others to distinguish *Panicum gattingeri* from *P. philadelphicum* causes difficulty in the placement of a large proportion of collections, and suggests that these entities may not be distinct at the species level. Although some statistical trends are evident, these seem more on the order of those observed by Reeder (1986) in the *Eragrostis pectinacea* complex, suggesting that *P. gattingeri* may be worthy of recognition as a variety of *P. philadelphicum*, though McGregor (1984) leaves open the possibility that *P. gattingeri* may be a variety of *P. capillare*. Pending field observations during the 1988 growing season, I tentatively place *P. gattingeri* in synonymy with *P. philadelphicum*.

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CLADRASTIS KENTUKEA (DUM.-CORSET) RUDD IN SOUTHEAST MISSOURI

Rodney D. Doolen and Wanda S. Doolen[1]

Yellowwood [*Cladrastis kentukea* (Dum.-Corset) Rudd, syn. *C. lutea* (Michx. f.) K. Koch.] has been listed as threatened in the United States by Avensu and DeFillipps 1978 in the original Smithsonian report (Fed. Reg.-7-1-75) and has the status of rare in Missouri. Although not exceedingly rare (the species has been used as a cultivated ornamental), Yellowwood trees in native habitat rank amongst the United States' uncommon trees.

The historical range is southern Indiana and southern Illinois through Kentucky, North Carolina, Tennessee, Alabama and Georgia, west to Arkansas, southwest Missouri and eastern Oklahoma. Even though Yellowwood is distributed over this wide area, it occurs infrequently. The historic Missouri distribution is twelve sites from three southwestern counties: Taney, Stone and Barry.

Independent discoveries of the Yellowwood at Sam A. Baker State Park in Wayne County were made in 1983. Members of the Webster Groves Nature Society noted Yellowwood occurrence during a field trip to the park in June. Rod Doolen, located a tree growing on a steep talus-covered hillside in November. Subsequent searches resulted in counting thirty-nine additional individual trees within Sam A. Baker State Park boundaries in Brunot Quadrangle sections 5, 17, 20, & 21 T. 30 N R. 5 E. Sam A. Baker State Park is managed by the Missouri Department of Natural Resources.

The southeast Missouri site is a habitat of rocky hillsides and bluffs with north-northeast exposures along Big Creek Valley. Geologically old, the rocks and bluffs of this area were formed by volcanoes. The rock at the site is known as Mudlick Dellenite, an igneous intrusive of Cambrian age. The individual Yellowwood trees are found along steep (up to 400 feet high) hillsides covered with talus fields of the dellenite, or along bluffs, or in rock strewn ravines which dissect the bluff outcrops. Elsewhere in its range, *Cladrastis kentukea* is reported from limestone substrate, rich woods and/or calcareous bluffs. The southeast Missouri site significantly increases information on the Yellowwood's habitat profile and should lead to redefining the limiting factors long thought to influence the tree's distribution.

The state park has provided a protected environment for the trees since the park's designation in 1925. Associate species at this location include: *Tilia americana, Acer saccharum, Dryopteris marginalis, Polystichum acrostichoides, Cornus florida,* and *Prenanthes sp.* The Yellowwood population appears

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to be stable, typified by both large and small trees. One of the largest individuals possesses a triple trunk. Circumference at dbh of each trunk was measured in 1984 and recorded at 4'11" (149.9 cm), 1'11" (58.4 cm), and 2'2.75" (67.9 cm). The population is healthy but a small amount of disease is evident. Where trees have died, sprouts grow profusely from the stumps. Yellowwood tree flowering is observed at the site during the third and fourth weeks of May.

Herbarium voucher specimens have been deposited at the Department of Natural Resources Herbarium in Jefferson City, MO, and in the reference collections of the authors.

THE FLOWER

Once in a golden hour
  I cast to earth a seed.
Up there came a flower,
  The people said, a weed.

To and fro they went
  Thro' my garden bower,
And muttering discontent
  Cursed me and my flower.

Then it grew so tall
  It wore a crown of light,
But theives from o'er the wall
  Stole the seed by night.

Sow's it far and wide
  By every town and tower,
Till all the people cried,
 'Splendid is the flower.'

Read my little fable:
  He that runs may read
Most can raise the flowers now,
  For all have got the seed.

An some are pretty enough,
  An some are poor indeed;
And now again the people
  Call it but a weed.

Tennyson (1908)

THALIA DEALBATA (MARANTACEAE), A MISSOURI SURPRISE

Susan Price and George Rogers[1]

The odd aspects of *Thalia dealbata* Fraser ex Roscoe, powdery thalia (2n = 12), begin with its membership in the Marantaceae, a pantropical family of some 25-30 genera and 400 species, of which only *Thalia geniculata* and *T. dealbata* are indigenous to the continental U. S. *Thalia geniculata* ranges from Florida to Argentina, and is widespread in Africa, where it was probably introduced from the New World (Andersson 1981); *Thalia dealbata* inhabits the southern U. S., predominantly on the Coastal Plain, from South Carolina to Texas, Oklahoma, and southeastern Missouri. The approximately five additional species of *Thalia* reside in tropical America with restriction to wet habitats, a generic characteristic. An overview of *Thalia* with a comprehensive bibliography was published by Rogers (1984) and features detailed drawings and floral description for *Thalia geniculata*. Because *Thalia dealbata* is flowering in the Climatron at the Missouri Botanical Garden further research on this bizarre Missouri native species is possible.

Thalia dealbata looks more like it belongs in the deep tropics than in Missouri--the plants can be several meters tall, with inflorescences on scapes towering above *Canna-like or Heliconia*-like leaves and far over the head of the observer. This striking relative of cannas, heliconias, and bananas (all members of the Zingiberales) stands out dramatically from surrounding vegetation with which it shares swamps, streamsides, roadside ditches, and ponds. Several specimens at the Missouri Botanical Garden Herbarium came from "swamps" near Poplar Bluff in Butler County, Missouri and Heineke (1983) recently updated its status in that county. This species is also listed for Ripley, Cape Girardeau, Stoddard, and Scott Counties (Steyermark 1963; Wilson 1984). There are collections from Cape Giradeau County dated 1970 at MO. A 1910 report from St. Louis County probably came from cultivated material (Personal comm. with Mike Sweet). The most recent collections Ripley and 1937 Scott counties are 1951 and 1937 respectively. This should not mean that extirpation from these counties has occurred. They do indicate that these counties need to be explored for new populations. Since this species shows up in aquatic gardens and roadside ditches, caution should be exercised in accepting new distribution records. Yet, given the age of the oldest Missouri collections (Appendix), the tight clustering of most Missouri localities, and the overall distribution of *Thalia dealbata*, there is no doubt that the species is native to the state. The authors invite updated distribution information.

Thalia dealbata differs conspicuously from *T. geniculata* by having more compact inflorescences and by having the pruinose

[1] Missouri Botanical Garden, P. O. Box 299, St. Louis, MO 63166

bloom, for which *T. dealbata* is named, on the inflorescence axes and bracts. Further, in *T. geniculata*, a single petaloid flap arises vertically from the top edge of the floral hood.

The flowers of *Thalia dealbata* are borne in tightly appressed side-by-side in mirror-image pairs (Figures 1, 7), arranged along an eye-catching zig-zag inflorescence axes (Figure 2). As is characteristic of the Zingiberales, the perianth members are inconsequential relative to the highly modified and largely petaloid androecium (stamens). Consequently the petals and sepals are ignored in in our description. The showy parts of the flower, all purple, are nearly all drastically modified stamens, although this is scarcely discernible at a glance. With one exception, all are devoid of anthers. The androecium consists of the following components: Looking towards the open throat of a horizontal flower, the largest and showiest organ is an outer, flaglike staminode suggestive of a showy, protruding landing platform (Figures 1, 6, 7). Dissected from a bud, it is shaped like a broad paddle (Figure 6).

Above the outer, flaglike staminode is the cucullate staminode, which forms a pouch opening upward and enclosing a style, much like a bun enclosing a (bent) hotdog. Figure 4 illustrates an isolated cucullate staminode, and Figures 3 and 6 show its position relative to other floral organs. At the edge of the cucullate staminode away from the flower's twin, two long narrow appendages ("triggers"), rise vertically and directly into the middle of the (staminal) floral tube and block access to its depths. Here, the tube is narrowed by a callus (described below), and one of the "triggers" is broadened or forked apically (Figure 4.). The cucullate staminode is characteristic of the Marantaceae, but *Thalia* stands apart from other genera by having two rather than one appendage on it.

Inserted near the base of the cucullate staminode and connate with the hood at the edge toward the middle of the flower pair is the only fertile stamen. This is made up of a pollen-bearing fertile half-anther and a flaglike sterile half-anther (Figures 3, 6), the latter projecting vertically from the mouth of the flower above the outer flaglike staminode (Figure 1). In the bud, the fertile "half-anther" rests obliquely against the indented area of pollen deposition on the style (described below) within the cucullate staminode. The sterile "half-anther" lies outside of and alongside the cucullate staminode.

Called the "callose staminode" by some authors, the remaining staminode defines the floral shape by forming a broad, stiff hood over the other staminodes and the style (Figures 1, 3). The edge of the hood toward the other flower of the pair is basally connate with the pollen-bearing staminode. From the inner face of that side of the hood extends the flange (termed the "callus"; Figure 3), which narrows the tunnel under the hood. Looking into the hood, the callus looks a little like one half of a swinging door, but it also bends and extends back into the hood out of sight.

The style that lies inside the cucullate staminode represents an unstable arrangement. It is explosively springy,

and when the flower is probed, it jumps out of the cucullate staminode, curling upward and inward. In untripped flowers, the distal tip of the style ("stylar appendage") slopes back and slopes into the mouth of the tube like a ramp. The stylar appendage approximately continues the upward-sloping landing platform formed by the outer, flaglike staminode in such a way that an insect pushing into the flower would slide its ventral surface over the stylar appendage when entering the throat of the tube (imagine an insect proceeding from left to right over the style in Figure 6). Immediately basal to the stylar appendage on the underside of the style (as it rests in the cucullate staminode) is a scooplike stigmatic cavity (Figures 5, 6), and directly basal to this on the underside of the resting style is a second depression dubbed here the area of pollen deposition (Figures 5, 6). Recall that in the bud this area is in direct contact with the fertile half-anther, which deposits pollen onto it before and/or possibly during the stroke of the style. In dissected (tripped) flowers pollen grains fill the area of pollen deposition except for a hump at its distal end defined by the outer wall of the stigmatic cavity (the hump is represented by the triangle in Figure 5).

The floral morphology and action suggest the following interpretation of the pollination mechanism: In the untripped flower, the style is held in place by the cucullate staminode, which when deformed by jostling of the "triggers" or stylar appendage, releases its grip on the style. This curls upward and inwardly explosively in such a way that the stylar appendage sweeps under the insect; this is followed by the stigmatic cavity scooping pollen off of the visitor's ventral surface; additional pollen is then deposited from the area of pollen deposition onto the ventral surface of the insect. This can be envisioned by mentally bending the style in Figure 6 up and inward to the right under an imaginary insect above it and facing right. However, the motion of the style is a little more complex--its twists during its snap (Figure 3), coming to rest blocking the flower from further visits.

While the flowers can be tripped easily with a pencil (which provides the pencil-bearer with a minor thrill), and the mechanism outlined above is easy to infer, field observations identifying pollinating agent(s) and verification of the mechanism are desired. In Florida, Daniel Austin (pers. comm.) saw diverse insects visit *Thalia* (undoubtedly *T. geniculata*), but only carpenter bees (*Xylocopa*) were able to spring the trap. Muller (1883) mentioned "hive-bees" pollinating cultivated *T. dealbata* in Europe.

At the risk of anticlimax, the surprises do not end with the flowers. Seed dispersal via flotation is evidently aided by some combination of air spaces between the seed and fruit wall, curious air canals in the perisperm, and waxy bracts (Grootjen 1983; Esenbeck 1831). Further, arils on the seeds suggest the possible role of ants in dispersal. Careful field observations still need to be made.

Thalia dealbata has not been ignored by artists. An exquisite color plate holds a place in *Curtis's Botanical Magazine* (Figure 7), and Audubon (1966) perched his Golden-

Crowned Kinglet on the powdery thalia.

If you botanize in southeastern Missouri, you may well discover new localities for this rare species or discover new aspects of its floral biology. If nothing else, probe a flower with a thin stick, stand back, and see what happens.

We extend our thanks to Michael Sweet of the Missouri Natural Heritage Program for providing current locality data, to Daniel Austin who generously supplied his observations on *Thalia* pollinators to Rogers in 1983 and to Joyce Dill, horticulturist at the Missouri Botanical Garden who supplied living materials for dissection. .This work was done at the Missouri Botanical Garden as part of an effort to expand the botanical knowledge of the living collection.

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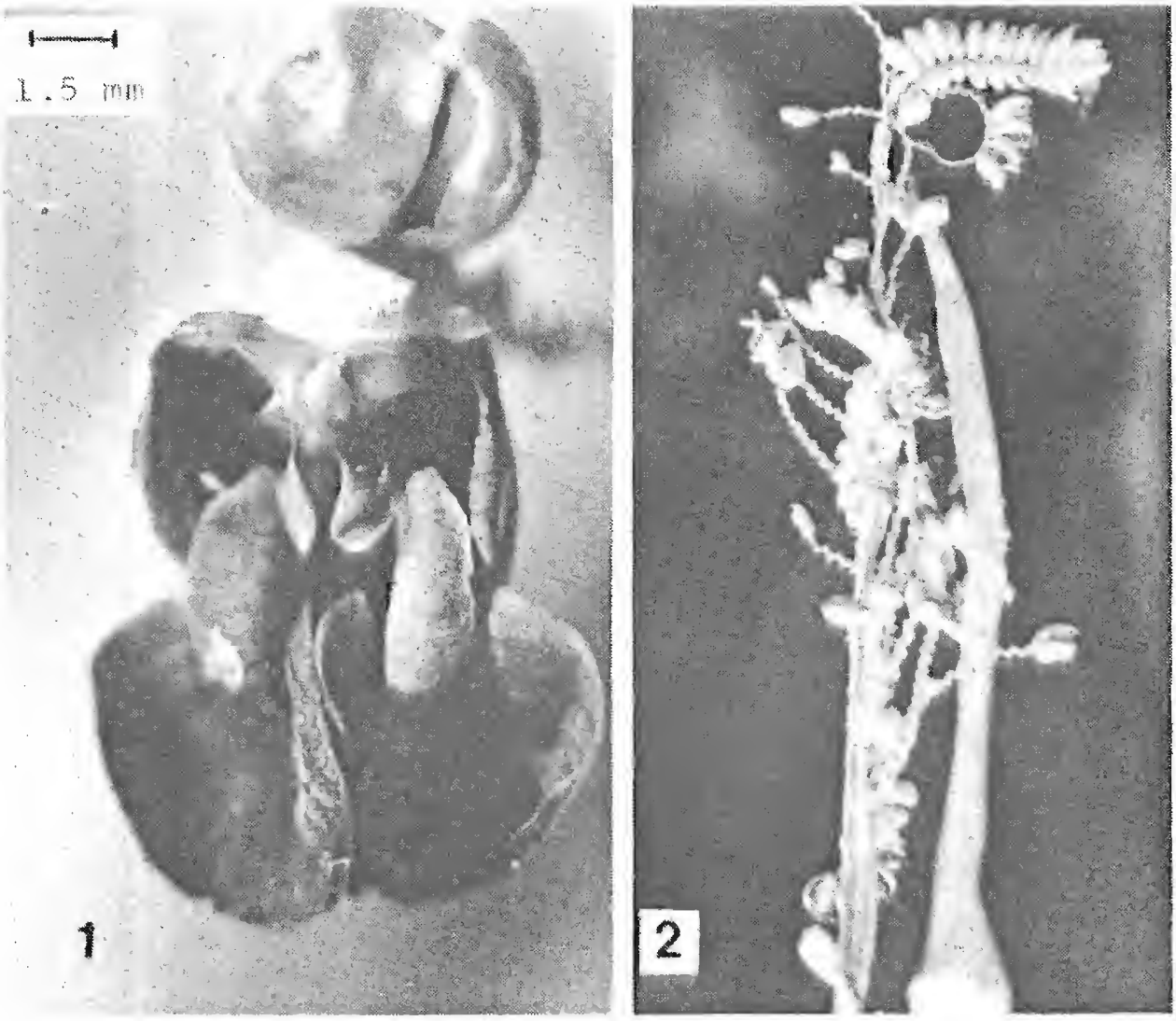
Steyermark, J. A. 1963. *Flora of Missouri*. lxxxiii + 1728 pp. Iowa State Univ. Press. Ames, Iowa. [*Thalia dealbata*. 467, 468, 471; includes distribution map.]

Wilson, J. H. (editor). 1984. *Rare & Endangered Species of Missouri*. 171 pp. Missouri Department of Conservation. Jefferson City, Missouri [*Thalia dealbata*, 100.]



Figures 1 & 2. *Thalia dealbata*. -- 1. Pair of flowers. Most basal organ is outer, flaglike staminode. Sterile "half-anther" projects, standing vertically, just above staminode. Androecial floral tube defined by hood arches over sterile "half-anther." Buds visible above flower pair. These flowers tripped, with the curled style just visible inside roof of tube in right-hand flower. Perianth not visible. --2. Inflorescence. Note zig-zag rachises (there are about 6 zig-zags per centimeter).

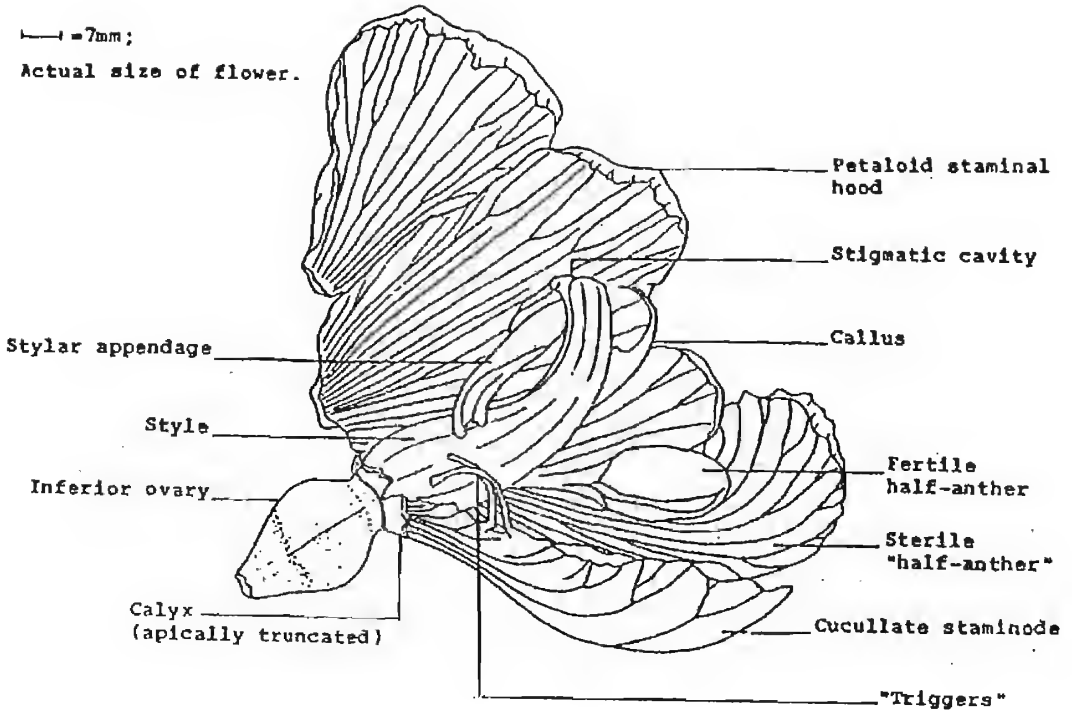


Figure 3. *Thalia dealbata.* Hood from opened flower to show various androecial organs and tripped style. Perianth and outer flaglike staminode not shown. (Drawing by Susan Price).

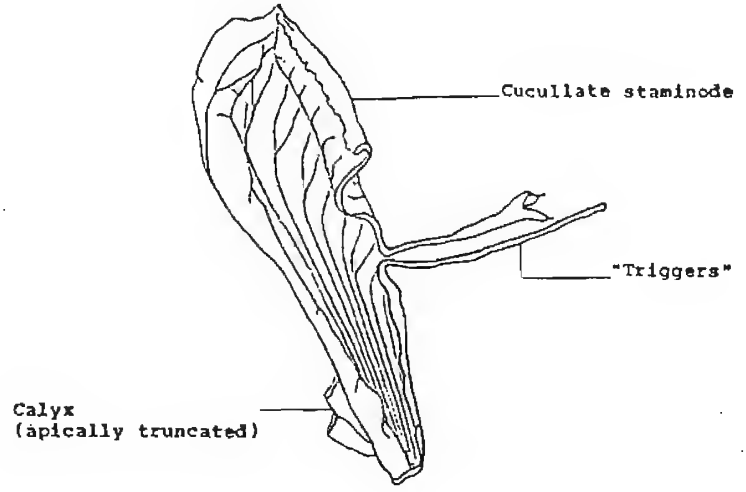


Figure 4. *Thalia dealbata.* Isolated cucullate staminode; note forked "trigger." (Drawing by Susan Price).

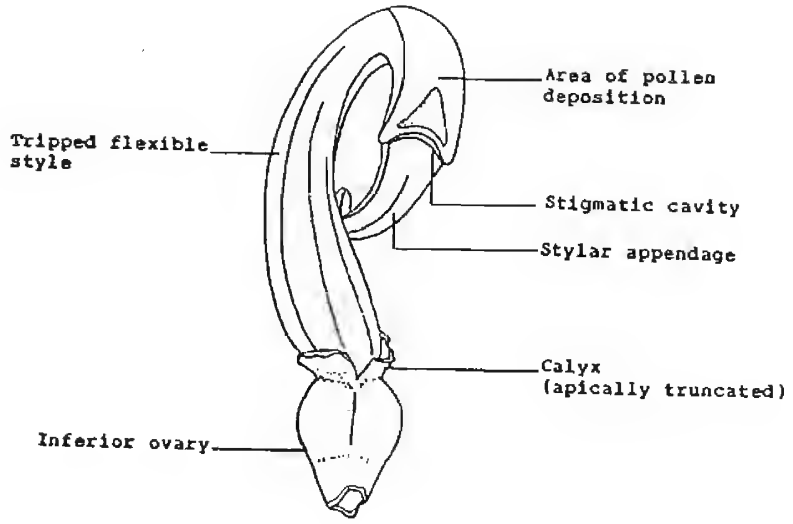


Figure 5. *Thalia dealbata*. Isolated tripped style; triangle is roof over stigmatic cavity. (Drawing by Susan Price).

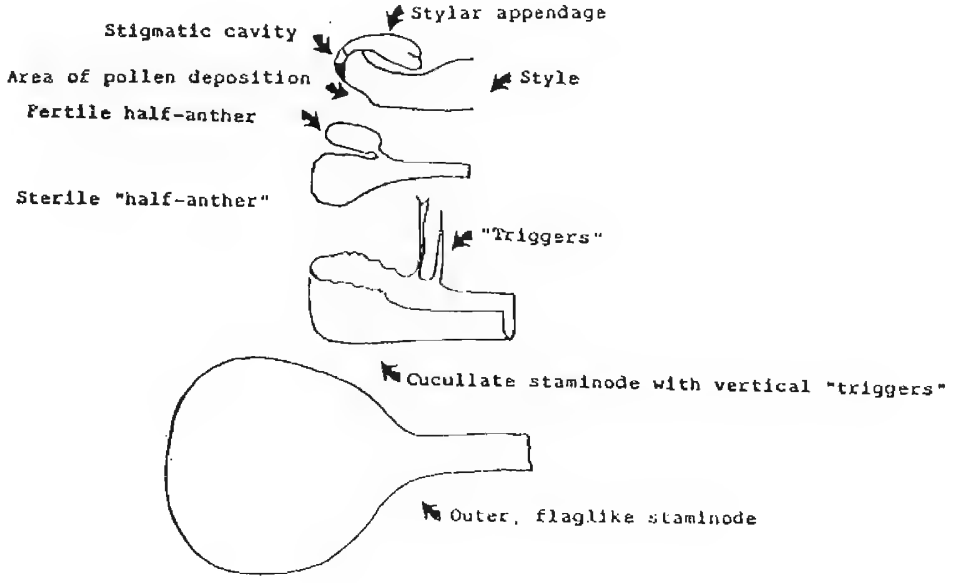


Figure 6. *Thalia dealbata*. Schematic representation of dissected bud showing relative vertical positions of inner organs. The fertile half-anther rests against the area of pollen deposition on the style within the cucullate staminode. The sterile "half-anther" lies outside the cucullate staminode. The stylar appendage curls back above (or partly alongside) the rest of the style, and the area of pollen deposition is just basal to the stigmatic cavity. (Drawing by George Rogers).

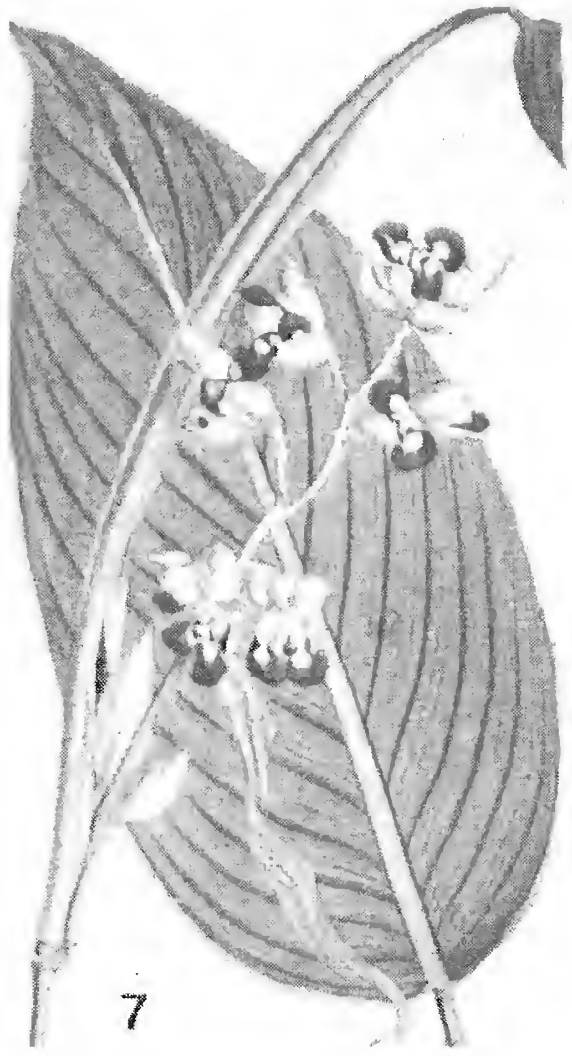


Figure 7. Reproduction of historical color plate of *Thalia dealbata* from *Curtis's Botanical Magazine*, Plate 1690. 1815.

APPENDIX

List of specimens of *Thalia dealbata* at the Missouri Botanical Garden (MO) collected in Missouri.

Butler County: swamps, 30 Aug. 1892, *Eggert s.n.*; swamps, 7 July 1892, *Eggert s.n.*; Blue Spring Pike, Poplar Bluff, 19 Aug. 1892, *Eggert s.n.* [this specimen also labeled "Blue Springs"]; Poplar Bluff, swamps, 12 July 1930? [label unclear on year], *J. Kellogg s.n.* Cape Girardeau County: 5.1 mi. W of Delta, Hwy. 25, 26 July 1970, *S. A. Sutter 159*; 1.5 mi. W Delta, Hwy. 25, 19 July 1970, *S. A. Sutter & T. E. Brooks 149.*

MINUTES OF THE APRIL 23, 1988 BOARD MEETING

Call to Order. The meeting was called to order by President Doug Ladd at 7:25 P.M. Other board members present were: Linda Ellis, Ken McCarty, Ginny Wallace, Mervin Wallace and Wally Weber. Other members present at the meeting were: Sue Hollis, Don Kurz, Jim Henry Wilson, Dennis Hall, Nina Bicknese, Julie Binder, Jon Rebman, and Joanna Turner.

Minutes of the Previous Meeting. The minutes of the December 5, 1987 meeting held at the Missouri Department of Conservation headquarters in Jefferson City, were approved as amended.

Treasurer's Report. Mervin Wallace presented the following operating statement for 12/2/87 to 4/22/88:

Balance on hand 12/2/87	$4,035.45
Income from operations	
Membership dues	1,863.00
Interest from checking account	135.69
Total income and cash on hand	6,034.14
Disbursements	
Refreshments--December board meeting	4.26
Bulk mailings	150.00
Printing costs for *Missouriensis*	198.54
Chapter dues	53.00
Printing--brochures	859.36
Conservation Federation of Missouri dues	357.00
Stamps and envelopes	15.61
Total disbursements	1,368.27
Balance on hand 4/22/88	$4,395.87

Standing Committee Reports.

Membership Committee. Ginny Wallace announced that the new brochures were helpful in recruiting members and in making the society better known. She also reported that MONPS was listed as a resource in a *Family Circle* magazine article on wildflower gardening, and several requests for information have already been received.

Environmental Action. Ken McCarty, reporting for Chairman Paul Nelson, asked members to try to get as many signatures as possible on petitions to extend the sales tax for state parks and soil conservation. Ladd advised us that Nelson had sent a letter for the society to the U.S. Forest Service encouraging the adoption of Alternative A. No Mining in the Mark Twain National Forest.

Field Trip Committee. Ken McCarty announced that the annual meeting will be held June 4-5 in Brookfield, with field trips on Saturday to bottomland forest and wet prairie habitats in Pershing State Park, and on Sunday to a marsh and a mesic prairie.

Atlas Committee. Wally Weber had no new report, but he introduced Jon Rebman, a student at Southwest Missouri State University, to the group. Jon was responsible for much of the work in getting out the long list of county records published in the last issue of *Missouriensis*, and he was warmly applauded for his efforts.

Editorial Committee. Paul Redfearn was unable to attend the meeting but sent word that he had enough material to publish volume 8, number 2 of the journal. However, he said that most of the papers received were of a fairly technical nature, and he would like to balance them with some of a more general nature. Ladd passed out notes taken at the March 21, 1986 meeting of the editorial committee regarding the journal and the newsletter, and he asked members to send him any comments or suggestions they might have.

Old Business.

President Ladd said the society's cash flow will be discussed at the June meeting. Kay Yatskievych will also report at that time on the recent Conservation Federation meeting which she attended as our representative. Ladd also reported that a letter to Peabody Coal thanking them for cooperating with a recent plant salvage operation is ready to be mailed.

Sue Hollis requested that a current membership list be published in the next issue of *Missouriensis*, and Ginny Wallace said that she would try to supply one by June.

New Business.

It was announced that Wanda Doolen and Louise Wienchowski have been nominated for one position on the board which will be open in June and Suzy Russell and Joanna Turner for the second opening. Ladd and Ginny Wallace at present are the only members of the awards committee and they requested that nominations be sent in as soon as possible for the June annual meeting. Weber inquired about the status of the grants program, and Ginny Wallace explained that they are on hold pending clarification of the society's financial situation.

Kenton Olson has resigned as vice-president due to time pressures from his recent appointment as dean at his college and also a family illness, and a replacement will have to be appointed.

Ginny Wallace suggested that we consider selling lapel pins similar to those of the Missouri Prairie Foundation, as they are popular, inexpensive, and good money makers. The board voted to authorize her to look into it, and she and Linda Ellis will try to have a drawing to present to the board at the June meeting.

Ladd told of a meeting to be held in North Carolina July 28-30 by about 40 groups interested in forming a native plant

society alliance. It should be an interesting meeting for anyone able to attend.

Weber pointed out that MONPS is approaching its tenth birthday and proposed that we do something to note the anniversary. Ladd suggested a celebration at the annual meeting in June 1989 and said any ideas will be welcome.

Don Kurz informed the board that Carl Hunter, author of *Wildflowers of Arkansas*, would be available as a speaker for the fall meeting in West Plains. The second edition of his book will be available and he has offered to sell them at a 40% discount.

Chapter Reports.

Linda Ellis reported for the Kansas City chapter that they have an ongoing project with the Kansas City Department of Recreation and are looking for sources for wildflowers, both seeds and plants.

No representative from Kirksville was present, but Ladd told of their quick response in supplying a crew to help The Nature Conservancy with a burn in north central Missouri.

Ginny Wallace announced that Bill Summers will be giving a program for the Jefferson City chapter, and their Pickle Springs field trip is scheduled for May 7.

Wally Weber said the Springfield chapter is becoming more active and had two recent programs, Jim Key on ferns and Stephan Foster on folk medicine.

Announcements

Jim H. Wilson announced that Steyermark's *Flora of Missouri* is out of print and Edgar Denison's *Missouri Wildflowers* might go out of print before his revision is published.

Adjournment.

The meeting was adjourned at 8:05 P.M.

Respectfully submitted,

Joanna Turner, Secretary Pro Tem

MISSOURI BOTANICAL RECORD

Compiled and Edited
By
Wallace R. Weber*, Jon P. Rebman*, and William Corcoran**

The *Missouri Botanical Record* is the official register for new county records of all vascular plant taxa in Missouri. To qualify for inclusion in this record, a voucher specimen of the record taxon must be deposited in a recognized herbarium and verified by the curator. Following the format used below, please submit all records to Dr. Wallace R. Weber, Department of Biology, Southwest Missouri State University, Springfield, MO., 65804.

In the *Flora of Missouri*, Steyermark used only a single map number to refer to each species, even though several subspecific taxa were listed. In these instances, various symbols were used to represent each taxon on a single Missouri map with counties. In the *Missouri Botanical Record* a decimal system is now being used, with .1 assigned to the first subpecific taxon listed by Steyermark under each map, .2 for the second, and so on. Point nine nine (.99) is used to designate a species in which Steyermark included one or more subspecific taxa, but which was not specified by the collector. Point zero nine (.09) identifies a taxon not included by Steyermark. The letter v. and f. refer to variety and form respectively, while nv indicates that no subspecific category has been recognized.

The contributor for this issue is Roy E. Gereau, Missouri Botanical Garden, St. Louis, MO. The asterisk before certain scientific names in the following list indicates a nomenclatural change. The name, as listed here, refers to nomenclature used by Steyermark; however, in another paper by Gereau elsewhere in this issue, a preferred nomenclatural change is given for this taxon.

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* Department of Biology ** Department of Geosciences, Southwest Missouri State University, Springfield, MO 65804

MAP #	TAXON	COUNTY	DATE	COLLECTOR	HERB
106	BROMUS INERMIS NV	CALLAWAY	6/20/87	GEREAU(2334)	MO
109	BROMUS SECALINUS NV	GASCONADE	5/17/87	GEREAU(2313)	MO
110	BROMUS MOLLIS NV	COLE	6/16/84	RAVEILL(2082)	MO
113	BROMUS JAPONICUS NV	COLE	6/16/84	RAVEILL(2073)	MO
113	BROMUS JAPONICUS NV	GASCONADE	6/8/86	BRANT(894)	MO
113	BROMUS JAPONICUS NV	PHELPS	6/6/87	GEREAU(2323)	MO
113	BROMUS JAPONICUS NV	VERNON	6/22/78	CASTANER(5334)	MO
115	BROMUS STERILIS NV	COLE	6/16/84	RAVEILL(2085)	MO
115	BROMUS STERILIS NV	PHELPS	6/6/87	GEREAU(2322A)	MO
116	BROMUS TECTORUM NV	PHELPS	6/6/87	GEREAU(2322)	MO
116	BROMUS TECTORUM NV	SAINTCLAIR	6/1/78	CASTANER(5183)	MO
121	FESTUCA OBTUSA NV	ADAIR	6/29/85	BRANT(634)	MO
121	FESTUCA OBTUSA NV	COLE	6/16/84	RAVEILL(2067)	MO
121	FESTUCA OBTUSA NV	JEFFERSON	5/30/1886	WISLIZENUS(658)	MO
121	FESTUCA OBTUSA NV	JOHNSON	6/16/03	STIGALL(60)	MO
121	FESTUCA OBTUSA NV	LEWIS	6/26/33	PALMER(40665A)	MO
121	FESTUCA OBTUSA NV	MARION	6/16/16	DAVIS(1494)	MO
121	FESTUCA OBTUSA NV	PHELPS	6/6/87	GEREAU(2329)	MO
121	FESTUCA OBTUSA NV	RALLS	5/31/73	HINTERHUER(146)	MO
121	FESTUCA OBTUSA NV	SAINTLOUIS	5/21/1896	EGGERT(NONE)	MO
122	FESTUCA PARADOXA NV	PERRY	7/5/86	GEREAU(2263)	MO
129.99	GLYCERIA STRIATA NV	COLE	6/16/84	RAVEILL(2055)	MO
132.99	POA ANNUA NV	AUDRAIN	4/21/85	GEREAU(1762)	MO
132.99	POA ANNUA NV	MONTGOMERY	4/6/85	BRANT(546)	MO
133	POA COMPRESSA NV	CALLAWAY	6/23/85	GEREAU(1791)	MO
137	POA SYLVESTRIS NV	LINCOLN	5/19/85	BRANT(573)	MO
139	POA BULBOSA NV	COLE	4/27/84	RAVEILL(NONE)	MO
139	POA BULBOSA NV	SAINTLOUIS	4/15/76	MUEHLENBACH(3924)	MO
144	ERAGROSTIS CAPILLARIS NV	COLE	10/6/84	RAVEILL(2182)	MO
147	ERAGROSTIS PECTINACEA NV	COLE	6/9/84	RAVEILL(2040)	MO
147	ERAGROSTIS PECTINACEA NV	JEFFERSON	8/30/86	RAVEN(27363)	MO
148	ERAGROSTIS CILIANENSIS NV	GASCONADE	8/3/86	GEREAU(2282)	MO
148	ERAGROSTIS CILIANENSIS NV	PERRY	9/21/85	BRANT(718)	MO
151.99	ERAGROSTIS HIRSUTA NV	SAINTLOUIS	8/16/70	MUEHLENBACH(3374)	MO
152	ERAGROSTIS INTERMEDIA NV	COLE	10/6/84	RAVEILL(2175)	MO
152	ERAGROSTIS INTERMEDIA NV	JEFFERSON	8/24/86	RAVEN(27345)	MO
154.99	ERAGROSTIS SPECTABILIS NV	AUDRAIN	8/25/85	BRANT(695)	MO
154.99	ERAGROSTIS SPECTABILIS NV	NEWMADRID	8/15/87	GEREAU(2350)	MO
159.99	DIARRHENA AMERICANA NV	ST.FRANCOIS	8/3/86	BRANT(961)	MO
164.99	DACTYLIS GLOMERATA NV	PHELPS	6/6/87	GEREAU(2325)	MO
171	TRIDENS STRICTUS NV	COLE	10/6/84	RAVEILL(2173)	MO
177	TRITICUM AESTIVUM NV	MONTGOMERY	5/26/85	GEREAU(1783)	MO
184	ELYMUS RIPARIUS NV	JASPER	6/20/03	PALMER(588)	MO
184	ELYMUS RIPARIUS NV	SAINTLOUIS	8/1884	KELLOGG(NONE)	MO
185.99	ELYMUS VIRGINICUS NV	COLE	6/16/84	RAVEILL(2064)	MO
185.99	ELYMUS VIRGINICUS NV	PERRY	10/6/85	BRANT(748)	MO
188.99	HORDEUM JUBATUM NV	CALLAWAY	6/20/87	GEREAU(2335)	MO
189	HORDEUM PUSILLUM NV	COLE	6/16/84	RAVEILL(2054)	MO
191	LOLIUM PERENNE NV	LINCOLN	6/15/85	BRANT(617)	MO
191	LOLIUM PERENNE NV	PIKE	6/22/85	BRANT(621)	MO
197	SPHENOPHOLIS NITIDA NV	JEFFERSON	5/7/87	RAVEN(27493)	MO
215	AGROSTIS HYEMALIS V.HYEMALIS	PERRY	5/26/86	BRANT(858)	MO
217.99	CINNA ARUNDINACEA NV	PERRY	9/28/85	BRANT(732)	MO
219	ALOPECURUS AEQUALIS NV	CLAY	6/23/85	RAVEILL(2318)	MO
220	ALOPECURUS CAROLINIANUS NV	COLE	6/9/84	RAVEILL(2042)	MO

221	PHLEUM PRATENSE NV	BARRY	6/20/79	HORNBERGER(423) MO
221	PHLEUM PRATENSE NV	CALLAWAY	6/23/85	GEREAU(1790) MO
221	PHLEUM PRATENSE NV	COLE	6/16/84	RAVEILL(2060) MO
221	PHLEUM PRATENSE NV	GASCONADE	7/19/86	GEREAU(2270) MO
228	MUHLENBERGIA FRONDOSA F.FRONDOSA	PERRY	10/6/85	BRANT(755) MO
229.99	MUHLENBERGIA SYLVATICA NV	JEFFERSON	9/5/86	RAVEN(27398) MO
229.99	MUHLENBERGIA SYLVATICA NV	PERRY	9/21/85	BRANT(723) MO
231.99	MUHLENBERGIA SCHREBERI NV	JEFFERSON	10/13/85	BRANT(766) MO
231.99	MUHLENBERGIA SCHREBERI NV	RALLS	9/12/86	BRANT(1001) MO
231.99	MUHLENBERGIA SCHREBERI NV	STE.GENEVIEVE	7/6/85	BRANT(641) MO
232	MUHLENBERGIA CAPILLARIS NV	PERRY	10/6/85	BRANT(749) MO
233.99	SPOROBOLUS VAGINIFLORUS NV	COLE	10/6/84	RAVEILL(2183) MO
233.99	SPOROBOLUS VAGINIFLORUS NV	PERRY	9/21/85	BRANT(716) MO
236.99	SPOROBOLUS CLANDESTINUS NV	MILLER	10/29/86	DAVIDSE(31716) MO
238	SPOROBOLUS HETEROLEPIS NV	PERRY	10/19/86	BRANT(1025) MO
238	SPOROBOLUS HETEROLEPIS NV	SAINTCLAIR	9/16/79	CASTANER(5944) MO
245	STIPA SPARTEA NV	PIKE	6/15/85	BRANT(612) MO
247.99	ARISTIDA DICHOTOMA NV	FRANKLIN	10/5/86	BRANT(1008) MO
247.99	ARISTIDA DICHOTOMA NV	MILLER	10/29/86	DAVIDSE(31721) MO
248	ARISTIDA OLIGANTHA NV	MONROE	10/19/86	BRANT(1023) MO
248	ARISTIDA OLIGANTHA NV	NEWMADRID	8/16/87	GEREAU(2367) MO
248	ARISTIDA OLIGANTHA NV	RALLS	9/12/86	BRANT(999) MO
250	ARISTIDA LONGISPICA V.LONGISPICA	AUDRAIN	9/21/85	GEREAU(1837) MO
250	ARISTIDA LONGISPICA V.LONGISPICA	PERRY	10/19/86	BRANT(1027) MO
254	ARISTIDA PURPURASCENS NV	PERRY	10/19/86	BRANT(1026) MO
257	CYNODON DACTYLON NV	COLE	10/6/84	RAVEILL(2185) MO
258	SCHEDONNARDUS PANICULATUS NV	GASCONADE	6/8/86	BRANT(889) MO
261	GYMNOPOGON AMBIGUUS NV	BARRY	9/22/1896	BUSH(800) MO
261	GYMNOPOGON AMBIGUUS NV	CEDAR	9/27/47	STEYERMARK(65246) MO
261	GYMNOPOGON AMBIGUUS NV	SAINTLOUIS	9/19/1897	KELLOGG(NONE) MO
261	GYMNOPOGON AMBIGUUS NV	VERNON	10/17/15	BUSH(7888) MO
263	CHLORIS VERTICILLATA NV	COLE	8/20/84	RAVEILL(2164) MO
263	CHLORIS VERTICILLATA NV	MONTGOMERY	8/25/85	BRANT(689) MO
271	PHALARIS ARUNDINACEA NV	COLE	6/16/86	RAVEILL(2056) MO
271	PHALARIS ARUNDINACEA NV	GASCONADE	5/30/87	GEREAU(2321) MO
271	PHALARIS ARUNDINACEA NV	FRANKLIN	6/18/85	DAVIDSE(30817) MO
271	PHALARIS ARUNDINACEA NV	JOHNSON	7/3/72	MULLIKIN(710) MO
271	PHALARIS ARUNDINACEA NV	MONTGOMERY	5/26/85	BRANT(583) MO
271	PHALARIS ARUNDINACEA NV	SAINTCHARLES	5/12/85	BRANT(565) MO
271	PHALARIS ARUNDINACEA NV	SALINE	6/8/75	CASTANER(4009) MO
271	PHALARIS ARUNDINACEA NV	VERNON	5/22/79	OSKINS(342) MO
273	LEERSIA LENTICULARIS NV	PUTNAM	8/26/81	ANDERSON(153) MO
273	LEERSIA LENTICULARIS NV	SCOTLAND	9/10/86	BRANT(936) MO
275	LEERSIA VIRGINICA NV	PERRY	7/20/85	BRANT(663) MO
288	PASPALUM FLUITANS NV	PERRY	10/6/85	BRANT(757) MO
289	PASPALUM PUBIFLORUM V.GLABRUM	COLE	10/6/84	RAVEILL(2178A) MO
294	PASPALUM LAEVE V.LAEVE	BUTLER	8/30/1892	EGGERT(NONE) MO
294	PASPALUM LAEVE V.LAEVE	NEWMADRID	8/15/87	BRANT(1119) MO
294	PASPALUM LAEVE V.LAEVE	SAINTLOUIS	8/10/1897	LETTERMAN(NONE) MO
294.1	PASPALUM LAEVE V.CIRCULARE	DALLAS	8/30/81	LADD(5559) MO
294.2	PASPALUM LAEVE V.PILOSUM	BOONE	8/22/33	JEFFREY(170) MO
294.2	PASPALUM LAEVE V.PILOSUM	SAINTCLAIR	9/16/79	CASTANER(5989) MO
294.2	PASPALUM LAEVE V.PILOSUM	SAINTLOUIS	8/10/1897	LETTERMAN(NONE) MO
294.2	PASPALUM LAEVE V.PILOSUM	TEXAS	8/9/35	KELLOGG(NONE) MO
295.1	PASPALUM FLORIDANUM V.GLABRATUM	NEWMADRID	8/15/87	BRANT(1120) MO

325	PANICUM DICHOTOMIFLORUM NV	NEWMADRID	8/15/87	GEREAU(2357)	MO
325	PANICUM DICHOTOMIFLORUM NV	PERRY	9/7/85	BRANT(711)	MO
329.99	PANICUM CAPILLARE NV	AUDRAIN	9/2/85	GEREAU(1824)	MO
329.99	PANICUM CAPILLARE NV	CALLAWAY	8/10/85	BRANT(676)	MO
329.99	PANICUM CAPILLARE NV	JEFFERSON	9/1/86	RAVEN(27390)	MO
329.99	PANICUM CAPILLARE NV	PERRY	9/7/85	BRANT(705)	MO
331.99	PANICUM VIRGATUM NV	PERRY	10/6/85	BRANT(747)	MO
339	ECHINOCHLOA MURICATA V.MURICATA	MONTGOMERY	8/25/85	GEREAU(1815)	MO
339.3	ECHINOCHLOA MURICATA V.MICROSTACHYA	NEWMADRID	8/16/87	GEREAU(2370)	MO
343.99	SETARIA VIRIDIS NV	COLE	8/20/84	RAVEILL(2156)	MO
344	SETARIA FABERI NV	CALLAWAY	8/10/85	GEREAU(1810)	MO
344	SETARIA FABERI NV	COLE	8/20/84	RAVEILL(2157)	MO
344	SETARIA FABERI NV	NEWMADRID	8/15/87	GEREAU(2351)	MO
344	SETARIA FABERI NV	PERRY	7/13/85	GEREAU(1798)	MO
345	SETARIA ITALICA NV	GASCONADE	7/19/87	GEREAU(2343)	MO
346	CENCHRUS LONGISPINUS NV	COLE	8/20/84	RAVEILL(2153)	MO
351	ARTHRAXON HISPIDUS V.HISPIDUS	CRAWFORD	9/27/87	SULLIVAN(NONE)	MO
353	ANDROPOGON GERARDII V.GERARDII	JEFFERSON	9/1/86	RAVEN(27375)	MO
355	ANDROPOGON VIRGINICUS NV	AUDRAIN	9/21/85	GEREAU(1838)	MO
355	ANDROPOGON VIRGINICUS NV	PERRY	9/21/85	BRANT(720)	MO
356	ANDROPOGON ELLIOTTII NV	FRANKLIN	10/5/86	BRANT(1009)	MO
358	SORGHUM HALEPENSE NV	COLE	8/20/84	RAVEILL(2150)	MO
358	SORGHUM HALEPENSE NV	PERRY	8/18/85	BRANT(688)	MO
360	SORGHASTRUM NUTANS NV	AUDRAIN	9/15/85	GEREAU(1832)	MO
360	SORGHASTRUM NUTANS NV	MONTGOMERY	9/2/85	GEREAU(1821)	MO
362	TRIPSACUM DACTYLOIDES NV	ADAIR	6/29/85	BRANT(628)	MO
362	TRIPSACUM DACTYLOIDES NV	GASCONADE	7/19/87	GEREAU(2347)	MO
362	TRIPSACUM DACTYLOIDES NV	PERRY	6/29/85	BRANT(628)	MO
107.99	*BROMUS PURGANS NV	GASCONADE	6/8/86	BRANT(903)	MO
107.99	*BROMUS PURGANS NV	PERRY	5/26/86	BRANT(864)	MO
120.2	*FESTUCA ELATIOR V.ARUNDINACEA	CLARK	5/21/85	GEREAU(1775)	MO
120.2	*FESTUCA ELATIOR V.ARUNDINACEA	COLE	6/16/84	RAVEILL(2066)	MO
120.2	*FESTUCA ELATIOR V.ARUNDINACEA	GASCONADE	6/8/86	BRANT(895)	MO
120.2	*FESTUCA ELATIOR V.ARUNDINACEA	LEWIS	5/21/85	GEREAU(1780)	MO
120.2	*FESTUCA ELATIOR V.ARUNDINACEA	PHELPS	6/6/87	GEREAU(2324)	MO
156	*DIPLACHNE FASCICULARIS NV	COLE	8/20/84	RAVEILL(2160)	MO
156	*DIPLACHNE FASCICULARIS NV	STODDARD	8/15/87	BRANT(1125)	MO
168	*TRIOENS FLAVUS F.FLAVUS	COLE	8/20/84	RAVEILL(2163)	MO
178	*AEGILOPS CYLINDRICA NV	COLE	6/9/84	RAVEILL(2043)	MO
183	*ELYMUS CANADENSIS F.CANADENSIS	COLE	6/16/84	RAVEILL(2065)	MO
183	*ELYMUS CANADENSIS F.CANADENSIS	FRANKLIN	6/18/85	DAVIDSE(30827)	MO
194	*KOELERIA CRISTATA NV	GASCONADE	6/8/86	BRANT(899)	MO
196	*SPHENOPHOLIS INTERMEDIA NV	JEFFERSON	5/7/87	RAVEN(27490)	MO
196	*SPHENOPHOLIS INTERMEDIA NV	MONTGOMERY	5/26/85	GEREAU(1787)	MO
196	*SPHENOPHOLIS INTERMEDIA NV	PERRY	5/26/86	BRANT(857)	MO
195	SPHENOPHOLIS OBTUSATA V.OBTUSATA	LINCOLN	6/1/85	BRANT(599)	MO
212	*AGROSTIS ALBA V.ALBA	CALLAWAY	6/20/87	GEREAU(2336)	MO
212	*AGROSTIS ALBA V.ALBA	COLE	6/16/84	RAVEILL(2083)	MO
212	*AGROSTIS ALBA V.ALBA	JEFFERSON	7/26/86	RAVEN(27224)	MO
227	*MUHLENBERGIA BRACHYPHYLLA F.BRACHYPHYLLA	JACKSON	9/20/17	BUSH(8188)	MO
227	*MUHLENBERGIA BRACHYPHYLLA F.BRACHYPHYLLA	MONROE	9/5/73	HINTERHUER(971)	MO
227	*MUHLENBERGIA BRACHYPHYLLA F.BRACHYPHYLLA	PERRY	9/28/85	BRANT(729)	MO
228.2	*MUHLENBERGIA GLABRIFLORA NV	MONROE	10/19/86	BRANT(1019)	MO
235.2	*SPOROBOLUS ASPER V.HOOKERI	MONROE	10/19/86	BRANT(1020)	MO
278	*DIGITARIA SANGUINALIS V.SANGUINALIS	COLE	10/6/84	RAVEILL(2178)	MO

278.1	*DIGITARIA SANGUINALIS V.CILIARIS	JEFFERSON	7/26/86	RAVEN(27242)	MO
278.1	*DIGITARIA SANGUINALIS V.CILIARIS	NEWMADRID	8/15/87	GEREAU(2358)	MO
279.99	DIGITARIA ISCHAEMUM NV	GASCONADE	8/3/86	GEREAU(2275)	MO
279.99	DIGITARIA ISCHAEMUM NV	PERRY	9/28/85	BRANT(739)	MO
282	ERIOCHLOA CONTRACTA NV	COLE	10/6/84	RAVEILL(2184)	MO
283	*ERIOCHLOA GRACILIS V.GRACILIS	NEWMADRID	8/16/87	BRANT(1135)	MO
291	*PASPALUM CILIATIFOLIUM V.CILIATIFOLIUM	JEFFERSON	10/19/86	RAVEN(27423)	MO
291	*PASPALUM CILIATIFOLIUM V.CILIATIFOLIUM	SHANNON	10/4/69	REDFEARN(1783)	MO
292	*PASPALUM BUSHII NV	JASPER	9/14/26	PALMER(31679)	MO
292	*PASPALUM BUSHII NV	RAY	7/11/21	BUSH(9409)	MO
292	*PASPALUM BUSHII NV	SAINTCHARLES	8/12/35	STEYERMARK(19487)	MO
292	*PASPALUM BUSHII NV	SAINTLOUIS	8/20/1894	LETTERMAN(NONE)	MO
292	*PASPALUM BUSHII NV	SCOTT	10/8/1893	EGGERT(NONE)	MO
292	*PASPALUM BUSHII NV	STODDARD	8/2/1895	BUSH(730)	MO
338.19	*ECHINOCHLOA CRUSGALLI V.CRUSGALLI	CALLAWAY	8/10/85	GEREAU(1813)	MO
338.19	*ECHINOCHLOA CRUSGALLI V.CRUSGALLI	COLE	10/6/84	RAVEILL(2188)	MO
338.19	*ECHINOCHLOA CRUSGALLI V.CRUSGALLI	JEFFERSON	7/29/86	RAVEN(27266)	MO
338.19	*ECHINOCHLOA GRUSGALLI V.CRUSGALLI	PERRY	7/13/85	GEREAU(1799)	MO
338.19	*ECHINOCHLOA CRUSGALLI V.CRUSGALLI	STODDARD	8/15/87	GEREAU(2360)	MO
340	*SETARIA GLAUCA NV	CALLAWAY	8/10/85	BRANT(675)	MO
340	*SETARIA GLAUCA NV	COLE	8/20/84	RAVEILL(2159)	MO
340	*SETARIA GLAUCA NV	GASCONADE	8/30/86	GEREAU(2286)	MO
340	*SETARIA GLAUCA NV	WARREN	8/10/85	BRANT(779)	MO
347.09	MISCANTHUS SACCHARIFLORUS NV	JOHNSON	8/27/84	DELOZIER(1604)	MO
352	*ANDROPOGON SCOPARIUS NV	PERRY	9/28/85	BRANT(726)	MO